

MINERALOGICAL ABSTRACTS

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Notices of Books.

(C. M.). *Dictionary of geological terms (exclusive of stratigraphic formations and paleontologic genera and species)*. Ann Arbor, Michigan (Edwards Brothers, Inc.), 1941, 464 pp. (mimeographed). Price \$6.00.

This useful publication approximately 17,000 terms in use in geological, paleontological, and mineralogical literature are defined. The definitions are given verbatim, without references to original literature and, in some cases at least, without necessary correction, from well-known dictionaries or glossaries, including the works of Holmes, Johannsen, Kemp, and Fay. Mineral names used are those given in Dana's text-book, supplemented by the publications of *Min. Mag.* **21-23**] and of *English* [M.A. **7-513**] on new minerals. A few terms, including rheomorphism, screen, pebble coal, fluorescence, and retrograde metamorphism, have not been found, and most of the modern nomenclature of textures and crystal-structure is excluded: otherwise the work appears to be reasonably comprehensive. Notwithstanding the title, a number of names of stratigraphical formations are included.

C. F. D.

ENHOFEL (W. H.) & TYLER (S. A.). *Methods of study of sediments*. New York and London (McGraw-Hill), 1941, vi+183 pp., 17 figs. Price 14s.

In this text-book the authors assemble and summarize useful techniques in the examination of sedimentary rocks. The work commences with a comprehensive 'flow-sheet for the study of sediments' which is expanded in later chapters to include investigation, collection of samples, mechanical analysis, separation of minerals, graphical representation, physical properties, making of thin sections, and kindred topics. There are few illustrations—of the seventeen text-figures, eleven are graphs and three photomicrographs. In a table of sieve sizes no mention is made of B.S.S. (British Standards Specification) sieves. Few workers using the peel method to study consolidated sediments are likely to prepare a close nitrate solution direct from gun-cotton, as is recommended, while expensive commercial preparations are available ready made.

C. F. D.

Artificial Minerals.

HEL-LÉVY (Albert) & WYART (Jean). *Transformation de verres naturels en roches cristallines par recuit sous haute pression de gaz et de vapeur d'eau*. (Compt. Rend. Acad. Sci. Paris, 1941, vol. 212, pp. 89-91.

The materials were subjected to high pressure by explosion in a steel bomb, followed by heating at 500-700° for 14-23 days [M.A. **8-112**]. Obsidian yielded quartz and spherulites of orthoclase. Andesitic dacite pumice gave quartz, orthoclase, and augite. Tektite (SiO_2 74.82%) from China gave quartz, spherulites of cristobalite, and plagioclase (An_{55}). A basic glass (SiO_2 43.84%) showed a tendency to devitrification, yielding augite and titanomagnetite.

L. J. S.

PORTEVIN (A. M.) & CASTRO (René). *Morphology of the inclusions in siderurgic products*. Journ. Iron & Steel Inst. London, 1935, no. 2, vol. 132, pp. 237 P-274 P, 18 pls.; 1936, no. 2, vol. 134, pp. 213 P-239 P, 15 pls.; 1937, no. 1, vol. 135, pp. 223 P-244 P, 9 pls.

PORTEVIN (Albert) & CASTRO (René). *Étude des inclusions dans les métaux*. Bull. Soc. Franç. Min., 1938, vol. 61, pp. 308-360, 43 figs.

A detailed description of the methods used to determine the nature of transparent and opaque inclusions in metals, alloys, and slags. Numerous examples of inclusions in steel illustrated by photomicrographs include corundum, cristobalite, ilmenite, chromite, vanadium-spinel, grunerite, and garnet. F. A. B.

SCHENCK (R.). *La multiplicité des minerais sulfurés et ses causes*. 17^{me} Congr. Chim. Indust., Paris (Soc. Chim. Ind.), 1937, pp. 619-629, 9 figs.

A number of sulphur-metal systems have been studied by means of the equilibrium $\text{MeS} + \text{H}_2 \rightleftharpoons \text{Me} + \text{H}_2\text{S}$, which becomes monovariant when three solid phases are present. Bi_2S_3 and Sb_2S_3 are completely miscible at 456° C. Ag_2S and Cu_2S form two series of mixed crystals with a miscibility gap near 90% Ag_2S ; the alkaline earths form compounds of type $\text{R}_2\text{Sb}_2\text{S}_5$ besides the well-known KSB_2S_4 . In appropriate three-component systems there appear $3\text{PbS} \cdot \text{Bi}_2\text{S}_3$ and $6\text{PbS} \cdot \text{Bi}_2\text{S}_3$ (510° C.); $\text{Cu}_2\text{S} \cdot 3\text{Bi}_2\text{S}_3$, $3\text{Cu}_2\text{S} \cdot 5\text{Bi}_2\text{S}_3$, and $3\text{Cu}_2\text{S} \cdot 2\text{Bi}_2\text{S}_3$ (510° C.); $3\text{Cu}_2\text{S} \cdot 4\text{Sb}_2\text{S}_3$, $4\text{Cu}_2\text{S} \cdot 5\text{Sb}_2\text{S}_3$, $\text{Cu}_2\text{S} \cdot \text{Sb}_2\text{S}_3$, and $4\text{Cu}_2\text{S} \cdot \text{Sb}_2\text{S}_3$ (400° C.); $5\text{PbS} \cdot 4\text{Sb}_2\text{S}_3$, $2\text{PbS} \cdot \text{Sb}_2\text{S}_3$, $3\text{PbS} \cdot \text{Sb}_2\text{S}_3$, and $5\text{PbS} \cdot \text{Sb}_2\text{S}_3$ (400° C.); Ag_2SbS_2 , $\text{Ag}_4\text{Sb}_2\text{S}_5$, and $\text{Ag}_2\text{Sb}_4\text{S}_4$, also mixed crystals of $\text{Ag}_4\text{Sb}_2\text{S}_5$ with up to 12 Ag_2S , of $\text{Ag}_2\text{Sb}_4\text{S}_4$ with Ag up to Ag_{23}SbS , and of Ag with Sb (400° C.). M. H. H.

SCHENCK (Rudolf) & FORST (Peter von der). *Gleichgewichtsstudien an erzbildenden Sulfiden. II*. Zeits. Anorg. Chem., 1939, vol. 241, pp. 145-157, 14 figs.

Studies of the systems Ni-S, Ni-Sb-S, and Ni-Bi-S. Compounds observed were: NiS, Ni_6S_5 , Ni_3S_2 , NiSbS (ullmannite), NiSb₂, NiSb (breithauptite), and $\text{Ni}_3\text{Bi}_2\text{S}_2$. NiBiS can probably be formed as a metastable phase under some circumstances. M. H. H.

HAWLEY (J. E.). *Heat effects on sulphides and possible applications*. University of Toronto Studies, Geol. Ser., 1941, no. 46, pp. 33-38.

To reproduce possible reactions in common iron, nickel, and copper ore polished sections were heated in air or H_2S for 2-18 hours at temperatures 390-775° C. Pyrrhotine and pentlandite in a siliceous gangue gave minute strings of pyrite; in magnetite-rich ore containing pyrrhotine, pentlandite, and chalcopyrite, pentlandite and chalcopyrite disappeared and veinlets of pyrrhotine appeared in the magnetite; ores containing pyrrhotine, chalcopyrite, blende, and galena developed new chalcopyrite replacing pyrrhotine; massive pyrrhotine gave a graphic arrangement of pyrite cubes on the surface. M. A. P.

BUERGER (Newton W.). *The chalcocite problem*. Econ. Geol., 1941, vol. 36, pp. 19-44, 8 figs.

Using chalcocite from Bristol, Connecticut, and artificial CuS, and a powder

era with a heating coil recalibrated against the inversion temperatures of Fe_2NO_3 , the boundaries of the phases chalcocine, chalcocine+digenite, digenite (Cu_5S_5), digenite+covellite, are placed up to 50°C . higher than in a previous report [M.A. 7-482]. Between room-temperature and 250°C . chalcocine now shows only one inversion, from an orthorhombic superstructure to a hexagonal structure, at 105°C ., in keeping with a break in the heating curve at 105°C .

M. A. P.

FLOR (Nelson W.) & LIN (Cho-Yuan). *Effect of various catalysts on conversion of quartz to cristobalite and tridymite at high temperatures*. Journ. Amer. Ceramic Soc., 1941, vol. 24, pp. 57-63.

The catalytic action of various chemicals and natural minerals in promoting normally sluggish inversion quartz \rightarrow tridymite \rightarrow cristobalite was studied at temperatures between 1000° and 1500°C . Even small amounts (0.1%) of alkali oxides or fluorides accelerate the inversion, but acid oxides (B_2O_3 , P_2O_5) have little or no effect.

C. F. D.

IZUKA (H.). *On the study of cristobalite*. [Journ. Geol. Soc. Japan, 1940, vol. 47, pp. 367-375], abstract in Rev. Physical Chem. Japan, 1941, vol. 15, p. 57.

Cristobalite was prepared from fused silica, agate, Si, SiO , and talc, and its growth and transition temperature followed by X-ray photographs. The lowest temperature at which it is formed is about 600°C .

L. J. S.

IRONI (Alessandro). *Sugli ossidi di piombo*. Gazz. Chim. Ital., 1938, vol. 68, pp. 387-393, 4 figs.

A study of the thermal decomposition of PbO_2 , with X-ray and magnetic examination of the product at various stages shows the existence of Pb_2O_3 and Pb_3O_4 as the only distinct phases; the black Pb_3O_4 of Le Blanc and Eberius (1822) and Pb_7O_{11} are not definite compounds. Changes in oxygen pressure between 5 and 200 atmospheres do not affect the oxidation of heated PbO . Preparations of ' Pb_2O ' proved to be mixtures of Pb and tetragonal PbO .

M. H. H.

MARK (George L.) & ROWAN (Robert). *Studies on lead oxides. IV. Polymorphic transitions by grinding, distortion and catalytic activity in PbO* . Journ. Amer. Chem. Soc., 1941, vol. 63, pp. 1302-1305, 3 figs.

— *Studies on lead oxides. V. Further experiments on compounds of the type $\text{PbO}_{n(n=1\text{ to }2)}$* . Ibid., pp. 1305-1310, 2 figs.

Massicot (orthorhombic) is converted by grinding into a distorted tetragonal phase which passes on annealing into normal litharge. Black PbO (from a hot saturated sodium plumbite solution by slow cooling) gave an X-ray pattern identical with that of massicot. The following higher oxides of lead are distinct crystalline phases: PbO_2 —this is only the ideal composition, never attained, is tetragonal phase having compositions down to $\text{PbO}_{1.66}$ (most commonly about $\text{PbO}_{1.95}$); Pb_5O_8 , tetragonal, a 5.508, c 5.460 Å., repeat Pb_5O_8 , obtainable

both by decomposition of PbO_2 and by oxidation of PbO , and also variable composition; Pb_2O_3 ; Pb_3O_4 ; and a new phase of unknown and probably variable composition and low symmetry, obtained only by oxidation of PbO . The 'black red lead' of Le Blanc and Eberius is a mixture of the new phase and Pb_5O_7 . [M.A. 8-216.]

M. H. H.

PETERSEN (Max). *Studies of the preparation and allotropic transformation of lead monoxide*. Journ. Amer. Chem. Soc., 1941, vol. 63, pp. 2617-2620.

$\text{Pb}(\text{OH})_2$ exists in one crystalline phase only; on dehydration finely divided $\text{Pb}(\text{OH})_2$ yields litharge (yellow, orthorhombic), coarse yields massicot (red tetragonal); the same effect of particle size is found in the decomposition of PbCO_3 . Litharge and massicot are enantiotropic with a transition temperature of 489°C ., litharge being the low-temperature phase. The conversion of massicot to litharge by grinding is very slight if the oxide is quite dry and protected from moisture, which catalyses the conversion.

M. H. H.

MONTORO (Vincenzo). *Miscibilità fra gli ossidi salini di ferro e di manganese*. Gazz. Chim. Ital., 1938, vol. 68, pp. 728-733, 2 figs.

— *Miscibilità fra i sesquiossidi di ferro e di manganese*. Ibid., 1940, vol. 70, pp. 145-149, 3 figs.

Ignition at 1200°C . of mixed precipitates of ferric and manganic hydroxides give mixed crystals of $(\text{Mn,Fe})_3\text{O}_4$. Up to 33% Mn_3O_4 the product is cubic, isomorphous with magnetite; above 66% Mn_3O_4 it is tetragonal, isomorphous with hausmannite, with an axial ratio increasing from about 1.00 to 1.155 as the manganese content increases; for Mn_3O_4 contents between 33 and 66% mixtures were obtained. $\alpha\text{-Fe}_2\text{O}_3$ (haematite) does not appear to dissolve any appreciable amount of Mn_2O_3 ; Mn_2O_3 (cubic) forms mixed crystals with up to 50% Fe_2O_3 without change in cell-side. The mixed crystals are not obtained by igniting a mixture of Fe_2O_3 and Mn_2O_3 at 800°C . but only from the $(\text{Mn,Fe})_3\text{O}_4$, which is oxidized by ignition in air at 800°C .

M. H. H.

FORESTIER (Hubert) & LONGUET (M^{lle} Jacqueline). *Formation du ferrite de cuivre à basse température*. Compt. Rend. Acad. Sci. Paris, 1939, vol. 208, pp. 1729-1730, 1 fig.

— & VETTER (M^{lle} Marcelle). *Étude des systèmes $\text{Fe}^2\text{O}^3\text{-NiO-Fe}^2\text{O}^3\text{-MgO}$, $\text{Fe}^2\text{O}^3\text{-NiO-Fe}^2\text{O}^3\text{-CuO}$; $\text{Fe}^2\text{O}^3\text{-NiO-Fe}^2\text{O}^3\text{-ZnO}$* . Ibid., 1939, vol. 208, pp. 164-167, 1 fig.

LONGUET (M^{lle} Jacqueline). *Formation des ferrites de nickel, de cobalt et de zinc à basse température*. Ibid., 1941, vol. 213, pp. 483-484.

These ferrites were prepared as mixed crystals by heating the precipitated hydroxides at $800\text{--}1000^\circ$; also by long boiling in water or by direct precipitation from boiling solutions. They are magnetic, Ni and Co ferrites strongly and Zn ferrite feebly. They all show the spinel type of structure with a regular variation in the cell side; for $\text{Fe}_2\text{O}_3\text{-CoO}$ a 8.33 \AA .

L. J. S.

DA (Gorton R.). *The preparation of fluorescent calcite*. Journ. Physical Chem., 1940, vol. 44, pp. 435-439, 1 fig.

Artificial mixed crystals (prepared by precipitation at 70° C.) of calcite with mol. % of manganous carbonate show a strong pink fluorescence; with more manganese the fluorescence decreases. At 100° C. in the absence of manganese with 3.3% manganese aragonite was obtained and was not fluorescent, but a 16% manganese weakly fluorescent manganocalcite was obtained both at 70° and at 100°. Calcites precipitated in presence of lead, copper, bismuth, and barium were not fluorescent.

M. H. H.

ERIN (Henri). *Sur les arsénates de calcium. Étude du système $As^2O^5-OCa-OH^2$ à 17°*. Compt. Rend. Acad. Sci. Paris, 1939, vol. 208, pp. 1016-1018.

- *Sur les arsénates de calcium. Étude du système $As^2O^5-OCa-OH^2$ à 40, 60 et 90°*. Ibid., 1941, vol. 212, pp. 544-547.

Amongst the several compounds obtained with varying concentration and of solutions and temperature are haidingerite and pharmacolite. L. J. S.

RUZHININ (I. G.) Дружинин (И. Г.). О природе твердых растворов типа глазерита и беркеита.—*On the nature of solid solution of the glaserite and berkeite type*. Изв. Акад. Наук СССР, Сер. Хим. (Bull. Acad. Sci. URSS, Sér. Chim.), 1938, pp. 1141-1165 (Russian), 1165-1166 (English summary), 18 figs.

A study of the systems $Na_2SO_4-K_2SO_4-H_2O$ and $Na_2CrO_4-K_2CrO_4-H_2O$, $K_2SO_4-K_2CrO_4-H_2O$ at 25° C. and of $Na_2SO_4-Na_2CO_3-H_2O$ and $Na_2CrO_4-Na_2CO_3-H_2O$ at 35° C. The compounds $K_3Na(SO_4)_2$ (glaserite), $K_3Na(CrO_4)_2$, $Na_2SO_4.Na_2CO_3$ (burkeite) [M.A. 6-53], and $2Na_2CrO_4.Na_2CO_3$ were observed; this is capable of giving solid solutions with its components to a limited extent; limiting ratios are $K:Na = 2.44-3.00$ (sulphate) and $2.39-3.16$ (chromate), $"":CO_3" = 1.48-2.19$, and $CrO_4"":CO_3" = 1.82-2.08$. Specific gravities and thermometric data are given for the solid solutions.

M. H. H.

KOLAEV (A. V.) & CHELISHCHEVA (A. G.) Николаев (А. В.) и Челищева (А. Г.). *The 25° isotherm of the systems: $CaO+B_2O_3+H_2O$ and $MgO+B_2O_3+H_2O$* . Compt. Rend. (Doklady) Acad. Sci. URSS, 1940, vol. 28, pp. 127-130, 2 figs.

The systems $MgO-B_2O_3-H_2O$ and $CaO-B_2O_3-H_2O$ have been studied at 25° C; equilibrium is only reached very slowly. The following compounds were observed: $CaO.B_2O_3.6H_2O$, α 1.504, γ 1.512, biaxial, prisms with negative elongation; $2CaO.3B_2O_3.13H_2O$, inyoite [M.A. 8-114]; $CaO.3B_2O_3.4H_2O$, α 1.505, γ 1.550, microcrystalline powder; $2MgO.3B_2O_3.15H_2O$, inderite, β 1.487, γ 1.505, $2V_\gamma < 60^\circ$, prisms with positive elongation and extinction-angle 6° ; $CaO.2B_2O_3.9H_2O$, uniaxial negative, hexagonal, ω 1.485, ϵ 1.442; $MgO.3B_2O_3.9H_2O$, uniaxial negative, ω 1.508, ϵ 1.463. Of these compounds only inderite and inyoite are congruently soluble.

M. H. H.

JANDER (Wilhelm) & FETT (Reinhold). *Hydrothermale Reaktionen. II. M teilung. Magnesiumhydrosilikate. II.* Zeits. Anorg. Chem., 1939, vol. 24 pp. 145-160, 4 figs.

Syntheses of serpentine and talc at temperatures up to 600° C. have been attained and the stability conditions for both silicates have been investigated. Chondrodite and humite have been synthesized, and reasons are advanced for considering that the 'basic' layer alternating with 'olivine' layers in the structures of the humite group has a composition varying little from $\text{Mg}(\text{OH})_2$. Anthophyllite and meerschaum could not be obtained synthetically.

M. H. H.

OSBORN (E. F.) & SCHAIRER (J. F.). *The ternary system pseudowollastonite-åkermanite-gehlenite.* Amer. Journ. Sci., 1941, vol. 239, pp. 715-763, 12 figs.

This is part of the quaternary system $\text{CaO-MgO-Al}_2\text{O}_3\text{-SiO}_2$ which includes many rock-forming minerals, and portions of it have already been investigated [M.A. 1-167, 168, 320, 321; 2-20]. In this ternary system only two crystalline phases (åkermanite-gehlenite solid solutions and $\alpha\text{-CaSiO}_3$) are in equilibrium with liquid, and there is no ternary eutectic. New data are also given for the binary systems gehlenite- CaSiO_3 , åkermanite- CaSiO_3 , and gehlenite-åkermanite. Two types of crystallization curves (fractional and equilibrium) are distinguished, and the courses of crystallization and the formation of zoned crystals are discussed.

L. J. S.

FOSTER (Wilfrid R.). *The system $\text{NaAlSi}_3\text{O}_8\text{-CaSiO}_3\text{-NaAlSiO}_4$.* Journ. Geol. Chicago, 1942, vol. 50, pp. 152-173, 7 figs.

This system is on a small plane inside the $\text{Al}_2\text{O}_3\text{-Na}_2\text{O-CaO-SiO}_2$ tetrahedron and owing to the presence of the anorthite molecule in the albite it is really a quaternary system. Thermal data by the quenching method and equilibrium diagrams are given for the binary systems $\text{NaAlSiO}_4\text{-NaAlSi}_3\text{O}_8$ [M.A. 7-287], $\text{NaAlSiO}_4\text{-CaSiO}_3$, and $\text{NaAlSi}_3\text{O}_8\text{-CaSiO}_3$. Five crystalline phases—plagioclase, pseudowollastonite, wollastonite, carnegieite, and nepheline—are recognized by their optical characters. The inversion temperature of wollastonite to pseudowollastonite is fixed at 1126°. The courses of crystallization and the petrological bearings are discussed.

L. J. S.

Chemical Crystallography.

WELLS (A. F.). *On the presentation of crystal chemistry.* Phil. Mag., 1941, ser. 2, vol. 32, pp. 106-136, 5 figs.

The systems of classification of crystal-structures given by recent writers [M.A. 7-311] are compared and criticized. A system which is primarily geometrical and based on observed interatomic distances is described. F. A. B.

COHEN (Ernst) & HORST (C. J. G. van der). *Die Metastabilität der Elemente und Verbindungen als Folge von Enantiotropie oder Monotropie. XIX. Die Monotropie des Eisens bei 1 Atm. Druck (Eis VIII).* Zeits. Physikal. Chem. 1938, Abt. B, vol. 40, pp. 231-251, 5 figs.

The existence of a cubic form of ice (ice-VIII) has been proved by X-ray study. Ice-VIII is metastable at atmospheric pressure, d_4^{-30} 1.05, and has a 9.68 Å. 32 molecules of H_2O per unit cell. Ice-VIII is readily obtained by crystallization of water at a low temperature from certain organic solvents—acetaldehyde, propionaldehyde, methyl ethyl ketone, or allyl alcohol. There is strong evidence that ice-VIII occurs naturally. M. H. H.

HERMANS (J.). *Les formes polymorphes des composés organiques*. Bull. Acad. Roy. Belg., Cl. Sci., 1939, ser. 5, vol. 25, pp. 417–430, 1 fig.

— review of polymorphism among organic compounds. M. H. H.

NRATH (A.) & NEUMANN (E.). *Über Mischkristalle in der Vitriolreihe*. V. Zeits. Anorg. Chem., 1939, vol. 242, pp. 70–78, 5 figs.

— study of the system $NiSO_4$ – $MgSO_4$ – H_2O at several temperatures.

M. H. H.

UHAUS (A.). *Verwachsungsgesetz und Mischungsmechanismus der anomalen Mischkristalle vom Typus des Eisensalmiaks*. Zeits. Krist., 1937, vol. 97, pp. 28–58, 11 figs.

— *Über die Gastkomponenten der Mischkristalle vom Typus des Eisensalmiaks. (Anomale Mischkristalle. II. Beitrag.)* Ibid., 1937, vol. 98, pp. 112–142, 3 figs.

Crystallographic, optical, and X-ray data are given and compared for the salts $MCl_2 \cdot 2H_2O$ ($M = Fe, Ni, Co, Mn, Cu$), $FeCl_3 \cdot H_2O$, and NH_4Cl , and for the anomalous mixed crystals $MCl_2 \cdot 2NH_4Cl \cdot 2H_2O$ and $FeCl_3 \cdot 2NH_4Cl \cdot H_2O$. [M.A. 4–301, 302.]

L. J. S.

UHAUS (A.). *Über die anomale Mischbarkeit organischer Substanzen. (Anomale Mischkristalle IV.)* Zeits. Krist., 1941, vol. 103, pp. 297–327, 5 figs.

New examples of anomalous mixed crystals are phthalic acid–methyl red, phthalic acid–methylene blue, and lead nitrate–barium nitrate–methylene blue. Crystallographic and X-ray data of these pairs are compared. [M.A. 4–301, 302.]

L. J. S.

JANS (Kasimir). *Polarization of ions and lattice distances*. Journ. Chem. Physics (Amer. Inst. Phys.), 1941, vol. 9, pp. 281–282, 1 fig.

— *Molar volume, refraction and interionic forces*. Ibid., p. 282.

— *One-sided polarization of ions in vapor molecules*. Ibid., pp. 378–379, 1 fig.

Deviations from the simple additivity law for interatomic distances in crystals are noted; also differences between the molar volume and refractivity in the crystal and in solution, and between the interionic distance in salt vapours and in the crystal; and a correlation with ionic polarization is attempted.

M. H. H.

CARMAN (P. C.). *Constitution of colloidal silica*. Trans. Faraday Soc., 1940, vol. 36, pp. 964-973, 2 figs.

It is believed that in all forms of silica, crystalline or amorphous, surface silicon atoms complete their tetrahedral co-ordination by reaction with water so that the surface, even of crystalline silica, is hydrated; hydrated silica is unstable and tends to self-condensation. The behaviour of silica sols and gels is discussed in detail, and the above reactions are shown to explain their properties satisfactorily.

M. H. H.

NIX (F. C.), BEYER (H. G.), & DUNNING (J. R.). *Neutron studies of order in Fe-Ni alloys*. Physical Rev. (Amer. Phys. Soc.), 1940, vol. 58, pp. 1031-1034, 1 fig.

The absorption coefficient for slow neutrons was used to compare the degree of structural ordering of quenched and annealed nickel-iron alloys of several compositions. Annealing induces a marked degree of ordering near the composition Ni_3Fe . Small amounts of Mo or Cr in the alloy reduce the ordering effect.

M. H. H.

KÖSTER (Werner) & MÜLFINGER (Willi). *Die Systeme Kupfer-Nickel-Schwefel und Kupfer-Nickel-Arsen*. Zeits. Elektrochem., 1940, vol. 46, pp. 135-144, 23 figs.

The systems Cu-Ni-S and Cu-Ni-As show no ternary compounds; Cu_2S and CuS do not take up NiS, nor does NiS take up CuS, but Ni_3S_2 takes up some copper. In Ni_5As_2 , much of the Ni can be replaced by Cu, but Cu_3As does not take up Ni. The alloy (Cu, Ni) dissolves little S, but considerable As.

M. H. H.

LAMB (Arthur B.) & WEST (Cutler D.). *The adsorption of nitrous oxide on certain pseudomorphs*. Journ. Amer. Chem. Soc., 1940, vol. 62, pp. 3176-3180, 2 figs.

Pseudomorphs formed by the partial dehydration of crystalline hydroxides of Mg, Ca, Zn, and by the partial decarbonatization of ZnCO_3 show considerable adsorptive activity, though far less than that of zeolites. There is a gradual increase in the activity to a maximum at 80-95 % dehydration, and then a rapid decrease to almost zero at complete dehydration. Brucite shows a maximum adsorption at 80 % dehydration, and the X-ray photograph shows that it consists almost entirely of MgO.

L. J. S.

ASADA (Y.). *Studies on alunite. VIII. The mechanism of the thermal decomposition of alunite. I*. [Bull. Inst. Phys. Chem. Research, Japan, 1940, vol. 19, pp. 976-991], abstract in Rev. Physical Chem. Japan, 1941, vol. 15, p. 59.

When alunite is heated fissures appear in the crystals at about 200° C. Dehydration is almost complete after one hour at 600°, and the crystals are destroyed becoming amorphous; but at 650° a new crystalline phase is developed which becomes more marked at 700°. Desulphatization occurs at 800°. Between 640° and 750° there is an exothermal effect.

L. J. S.

HEGUIN (*M^{lle} Thérèse*). *Sur l'existence de plusieurs formes de tartrate de calcium dérivées de l'acide tartarique droit*. Compt. Rend. Acad. Sci. Paris, 1941, vol. 213, pp. 203–206.

The small crystals of calcium tartrate usually precipitated from solutions of tartaric acid and a soluble calcium salt are orthorhombic and equiaxial; they contain $4\text{H}_2\text{O}$. Occasionally (especially with excess of calcium at a low temperature) larger acicular crystals are also formed. These are probably orthorhombic, but have lower refractive indices and give a different diffraction pattern; they contain $6\text{H}_2\text{O}$, and soon change over to the $4\text{H}_2\text{O}$ form.

L. J. S.

Growth and Corrosion of Crystals.

BUCKÝ (Vojtěch). *Ein Beitrag zur Kenntnis des Kristallwachstums*. Zeits. f. Krist., 1941, vol. 103, pp. 328–352, 9 figs.

Crystals of copper sulphate grown on a microscope slide were found in the majority of cases to lie on the m (110) face or on a nearby vicinal face. Crystals of K-Al-alum all lie strictly on (111) and are flattened parallel to this plane. The orientation of the crystals on the glass slide was determined by goniometric measurements; and with copper sulphate also from the optical orientation on a universal microscope stage. The optical orientation of copper sulphate, determined on larger measured crystals, agrees with that of Barth and Tunell [A. 5–306]. In fibrous aggregates of andalusite from Dolní Bory, Moravia, the fibres are all very nearly parallel, but the a - and b -axes are at all angles. In fibrous aggregates of monoclinic amphibole from Schmiedeberg, Silesia, the c -axes show a lower degree of parallelism; and in fibrous gypsum from Hildesheim, moreover, there is no uniformity in orientation. Radial aggregates of cane-sugar grown on a microscope slide show an approximate parallelism of the b -axes with the glass surface, but turned through different angles with no definite crystal orientation at the contact.

L. J. S.

REINSKY (S.). *The kinetics of crystal growth*. Acta Physicochimica U.R.S.S., 1939, vol. 10, pp. 825–844.

— & TODES (O.). *Abhängigkeit der Dispersionsverteilungsgesetze der Kristalle von der Kristallisationskinetik. I. Dispersionsstatistik bei freiem Wachstum*. Ibid., 1940, vol. 12, pp. 531–558, 14 figs.

— & TODES (O. M.). — *II. Gesetze der Kristallisation bei abnehmender Konzentration in homogener Phase*. Ibid., 1940, vol. 13, pp. 617–638, 8 figs.

(1) The dependence of the rate of crystal growth on the dimensions of the crystal is considered theoretically, assuming that growth takes place in discrete steps, initiated at 'two-dimensional nuclei' which then grow over a face. It is shown that unless the two-dimensional nuclei are always located at vertices the rate of growth will not be independent on the size of the crystal, but will increase rapidly with crystal size for crystals not much larger than nuclear size. The derivations of the equations derived are discussed. The small amount of experimental evidence available favours the new theory.

(2) The size-distribution of crystals growing freely in solution is discussed for several simplified cases. The results are in all cases far from a Gaussian type curve, and reasons why this type of distribution curve appears to satisfy experimental data on particle-size distribution in colloids are discussed; it is shown that clumping of primary crystals and growth of large crystals at the expense of smaller ones will tend to modify the primary distribution curve so as to simulate a Gaussian one.

(3) Isothermal crystallization from an initially supersaturated solution is considered theoretically, both for a solution initially containing nuclei (e.g. dust particles) and for one initially clear. General equations are derived involving assumptions as to the mode of variation of the nucleation and growth rates with the supersaturation but are not normally integrable; with certain assumptions the equations become integrable, and a number of such special cases are considered.

M. H. H.

BRADISTILOV (G.) & STRANSKI (I. N.). *Über die Gleichgewichtsform des Fluorkristalls*. Zeits. Krist., 1940, vol. 103, pp. 1-29, 14 figs.

The derivation of the equilibrium form of a crystal of fluorite. [M.A. 7-49531.] F. A. B.

UBBELOHDE (A. R.). *The electrolytic growth of ionic crystals*. Trans. Faraday Soc., 1940, vol. 36, pp. 863-867.

When a pair of electrodes of certain metals is immersed in a supersaturated solution of certain salts and a small current passed, crystallization sets in, at the anode only.

M. H. H.

[TILMANS (Y. Y.) ТИЛЬМАНС (Ю. Я.). Кристаллизация хлористого бромистого аммония из водных растворов в присутствии примеси ионов разных металлов.—TILMANS (J. J.). *Cristallisation du chlorure et du bromure d'ammonium de leurs solutions aqueuses en présence d'ions de métaux divers*. Журнал Общей Химии (Акад. Наук СССР) [Journ. Gen. Chem. Russ.], 1940, vol. 10, pp. 1631-1640, 7 figs. (Russian.)

The effect of various salts in the crystallizing solutions on the habit, crystal size, and tendency to dendritic growth of ammonium chloride and bromide have been studied.

M. H. H.

REITEMEIER (R. F.) & BUEHRER (T. F.). *The inhibiting action of minute amounts of sodium hexametaphosphate on the precipitation of calcium carbonate from ammoniacal solutions. I. Quantitative studies of the inhibition process*. Journ. Physical Chem., 1940, vol. 44, pp. 535-551, 5 figs.

— II. *Mechanism of the process, with special reference to the formation of calcium carbonate crystals*. Ibid., pp. 552-574, 13 figs.

A study of the action of sodium hexametaphosphate in delaying or inhibiting precipitation of calcium carbonate, and of its effect in modifying the crystal form of the precipitated calcite. It was noted that calcium carbonate precipitated from sodium chloride solutions is largely or wholly aragonite.

M. H. H.

ESSEN (R. G.). *Bijdrage tot de kennis der saponinen. IV. De invloed van sapoalbine op de kristallisatie van BaSO₄*. Natuurwet. Tijds. Gent, 1940, vol. 21 (for 1939), pp. 198–204, 3 figs.

Saponin slows the crystallization of barium sulphate markedly, induces the formation of smaller crystals, and changes the crystal habit. M. H. H.

NCE (Wesley G.) & WOLFE (Kathryn M.). *Adsorption at crystal-solution interfaces. XI. A study of the adsorption of isomeric monoazo dyes of crystals of sodium nitrate, sodium bromate, and sodium chlorate during their growth from solution*. Journ. Physical Chem., 1941, vol. 45, pp. 395–401, 1 fig.

The adsorption and modification of crystal habit was studied for 86 different dyes. 'No simple rule can as yet be made whereby one can correctly predict what foreign materials will be adsorbed by a given crystal.' M. H. H.

AN (L.) & MASING (G.). *Über die Keimbildung in Metallschmelzen*. Zeits. Elektrochem., 1940, vol. 46, pp. 109–119, 23 figs.

The rate of nucleus formation in the crystallization of molten aluminium and magnesium has been determined at various degrees of supercooling. The results are markedly according to the temperature at which the metal was fused; the lower this temperature, the lower the nucleation rate for a given degree of supercooling. M. H. H.

NAMON (C. A.) & MARTIN (Albert B.). *Growth conditions for single and optically mosaic crystals of zinc*. Journ. Applied Physics (Amer. Inst. Physics), 1940, vol. 11, pp. 487–490, 1 fig.

Single crystals of zinc free from mosaic or lineage structure can be grown by the Kapitza method if the ratio of the temperature gradient to the rate of growth is kept within well-defined limits varying with the orientation of the crystal relative to the growth surface. M. H. H.

MATHMEY (Allan T.) & BENTON (Arthur F.). *The growth, orientation, and preparation of the surface of single crystals of copper*. Journ. Physical Chem., 1940, vol. 44, pp. 35–42, 2 figs.

Large single crystals of copper have been prepared, and a method is described for their orientation and for the preparation of good faces parallel to definite crystallographic directions. M. H. H.

MAMOTO (M.). *On light figures in single crystals of nickel and copper*. [Nippon Kinzoku Gakkai-Si, 1940, vol. 4, pp. 368–376], abstract in Rev. Physical Chem. Japan, 1941, vol. 15, p. 57.

Single crystals of Ni and Cu, prepared by slow solidification, were etched with various acids and salt solutions, and the light-figures observed at intervals. These vary with the etching agent, temperature, and time of etching, but in all cases conform with the symmetry. The figures on (100) are the most suitable for determining the orientation of the crystals. L. J. S.

VOLMER (M.) & SCHMIDT (O.). *Über den Schmelzvorgang*. Zeits. Physikal. Chem. 1937, Abt. B, vol. 35, pp. 467-480, 3 figs.

The mechanism of fusion is essentially a reversal of crystallization, and normally begins slightly below the 'true' melting-point around specks of impurities. Under suitable circumstances a certain degree of local overheating should be possible; this has been confirmed experimentally for gallium.

M. H. H.

Colour of Minerals.

JOHNSTONE (Sydney J.). *Minerals for the paint industry*. Journ. Oil & Colour Chemists' Assoc., 1941, vol. 24, pp. 263-287.

White pigment minerals are those of Pb, Zn, Ti, Sb; and white minerals used as extenders and fillers include baryte, witherite, celestine, chalk, limestone, china-clay, china-stone, diatomite, fuller's earth, bentonite, gypsum, microsilica, and talc. Minerals yielding coloured pigments include asphalt, graphite, ilmenite, micaceous haematite, ochres, umbers, and powdered slate; and, after chemical treatment, minerals containing Cd, Cr, Co, Se. Radium and mesothorium are used in luminous paints, and borates and Mn minerals in driers. Details are given of the occurrence and production of these minerals especially in the British Isles.

L. J. S.

POCOCK (R. W.). *Ochres, umbers and other natural earth pigments of England and Wales*. Wartime Pamphlet no. 21, Geol. Surv. Great Britain, 1942, 19 pp. (mimeographed). Price 1s.

Deposits of mineral pigments in England and Wales are briefly described and references to previous literature are given.

C. F. D.

KENNARD (T. G.) & HOWELL (D. H.). *Types of coloring in minerals*. Amer. Mineralogist, 1941, vol. 26, pp. 405-421.

Having made the distinction between colouring due to characteristic absorption or reflection determined by chemical composition ('chemico-composition' coloring) and colouring caused by structural characteristics ('structural coloring'), criteria are suggested for determining the type or types of colouring displayed by any particular specimen. A bibliography is appended.

F. A. B.

NIKITINE (Serge). *Photodichroïsme de NaCl coloré*. Compt. Rend. Acad. Sci. Paris, 1941, vol. 213, pp. 32-34, 1 fig.

Crystals of NaCl prepared by fusion and coloured brown by β and γ radiation from a radium source were irradiated for several minutes by the light from a high-pressure mercury lamp. The crystals became paler in colour and developed a feeble dichroism. The effects observed and their explanation are probably the same previously recorded for silver halides.

F. A. B.

ANDERSON (B. W.). *Some causes of colour in gemstones*. Gemmologist, London, 1942, vol. 11, pp. 41-42.

A general and comprehensive account is given of the causes of the colour of

erals, so far as is yet known. Apart from colour due to dispersion and interference of light, they are grouped as follows: I, Idiochromatic minerals, in which colouring agent is due to the essential presence of Ti, V, Cr, Mn, Fe, Co, Ni, and Cu (atomic numbers 22-29). II, Allochromatic minerals: (a) normally colourless but with small-scale isomorphous replacement of a colouring molecule; (b) scattering of light by colloidal particles. In the last group colour changes may be effected by heat or various radiations; and the minerals show no well-marked absorption bands.

L. J. S.

FRANK (Frank B.). *Causes of colour in gems: some further notes*. Gemmologist, London, 1942, vol. 11, pp. 53-54, 60.

The various colours given by the elements of atomic numbers 22-29 (with different valencies) is attributed to selective absorption of light due to a transition effect in the outer valency levels of electrons in the atoms. L. J. S.

CHUP (M. Allen) & LEE (O. Ivan). *Experiments on the thermoluminescence of some common and unusual minerals*. Journ. Opt. Soc. Amer., 1940, vol. 30, pp. 206-223.

The effects of thermoluminescence, triboluminescence, and of fluorescence and phosphorescence in ultra-violet rays for 32 minerals (fluorite, calcite, apatite, dolomite, spodumene, lepidolite, feldspars, &c.) from many localities are compared and tabulated. Thermoluminescence commences at 44-107° and is extinguished at 24-474° in different minerals. No simple relation is traced between thermoluminescence and other forms of luminescence, and their relation to colour and presence of traces of impurities is obscure.

L. J. S.

BERLANDT (H.). *Über den Nachweis von Porphyrin und anderen organischen Substanzen in Kalkspat und Aragonit*. Naturwiss., 1939, vol. 27, pp. 613-614.

BERLANDT (Herbert). *Neue Ergebnisse der Lumineszenzanalyse an Mineralien mit organischen Beimengungen in ihrer geochemischen Bedeutung*. Chemie der Erde, 1940, vol. 13, pp. 221-230.

Calcite and aragonite from several localities show a red or blue fluorescence in ultra-violet rays, followed by a green phosphorescence. When the mineral is dissolved in dilute HCl, the solution, or the solution of the residue in amyl alcohol, is also fluorescent. From the absorption and fluorescence spectra porphyrin, anthracene, and other organic compounds were identified. Some other minerals (fluorite, baryte, &c.) may owe their fluorescence to hydrocarbons, such as idrialite and curtisite [M.A. 4-348].

L. J. S.

ESTON (Eric) & TURNER (W. E. S.). *The effect of small amounts of certain colouring oxides on the colour of a soda-lime-silica glass*. Journ. Soc. Glass Techn., 1941, vol. 25, pp. 5-20, 6 figs.

The amounts of different oxides which can be tolerated without development of appreciable tint in test pieces were found to be: TiO₂ (not less than) 0.5, V₂O₅ 0.001, MnO₂ 0.01, CuO 0.01, NiO 0.0005, and CoO 0.0005 %.

L. J. S.

FOX (Denis L.) & ANDERSON (Lloyd J.). *Pigments from marine muds*. *Proc. Nat. Acad. Sci. U.S.A.*, 1941, vol. 27, pp. 333-337.

Mud from depths of 201-1750 metres in the Gulf of California gave off HCH_4 and H_2 . Pigments extracted with acetone were green pigments (prochlorophyll and other chlorophyll derivatives, but no chlorophyll) and carotenoids, which were identified by their absorption spectra. A mud from 1300 off the Pacific coast of California contained a green fluorescent pigment similar to one from crude petroleum.

L. J. S.

Precious Stones.

WEBSTER (Robert). *Practical gemmology, a study of the identification of gemstones, pearls, and ornamental minerals*. With a foreword by B. W. ANDERSON. London (N.A.G. Press), [1941], iii+130, 4 pls., 57 text-figs. Price 5s. (\$1.75).

This small book gives many practical and useful hints for the determination of gemstones and their imitations; but on the theoretical side it contains many errors and ambiguities which will only confuse the beginner. The 19 short chapters, called 'lessons', each end with a 'recapitulation' and a set of 'test questions'. In the lesson on crystallography there is a confusion between axes of symmetry and the crystallographic axes of reference, and several of the figures of crystals are incorrectly drawn. In addition to the organic products, pearl, coral, amber, and jet, there is a chapter on tortoiseshell and ivory.

L. J. S.

GRODZINSKI (Paul). *Diamond and gem stone industrial production*. London (N.A.G. Press), 1942, 256 pp., 183 figs. Price 15s.

This well-illustrated volume gives full and practical details for the working of gemstones (and also of some other hard materials—sintered carbides), both for ornamental and industrial purposes, together with descriptions of the various types of machines in use. It collects together much more information than is to be found in any other volume. A translation of the author's earlier book on industrial diamonds [M.A. 7-126] is promised.

L. J. S.

MAR (Peter G.). *The use of precious stones in ancient medicine*. I. *Some inherent properties underlying their use in the Occident*. *China Journ.* Shanghai, 1941, vol. 34, pp. 79-88. II. *Some natural gem-stones used in Chinese medicine*. *Ibid.*, pp. 220-232.

Part I mentions some of the ancient western beliefs of the curative and preventative charms of gemstones in relation to their colour, hardness, touch, &c. Part II gives an account of the Chinese materia medica 'T'sao-Kang-Mu' written in 1597 by Li Shih Chen. Four volumes of this are devoted to 160 kinds of minerals and stones. Precious and semiprecious stones (under 14 headings and 16 sub-headings in vol. 8) include jade, malachite, agate, quartz (rock crystal and amethyst), &c. Only brief mention is made of diamond and corundum varieties. Many of the preparations for internal and external administration are for eye treatment. The oldest Chinese herbal is 'Pen Ching' by Shen Nung, 2838 B.C., in which various stones are mentioned.

L. J. S.

YAMA (Nobuo). *On jewels*. Journ. Geogr. (Tokyo Geogr. Soc.), 1939, vol. 51, pp. 350-362, 10 figs.
 Sōkichi). *Jewels of Japan*. Ibid., pp. 363-368.
 E (Takeo). *Facts and fancies of jewels of the East and the West*. Ibid., pp. 369-380, 2 pls. (Japanese only: English titles from wrapper.)

(Sydney H.). *The mining of gems and ornamental stones by American Indians*. Bull. Bur. Amer. Ethnology, Smithsonian Institution, 1941, no. 128 (Anthropological Papers no. 13), pp. ix xii, 1 77, 6 pls.

From archaeological and ethnographical books and papers (of which a long bibliography is given) much information is collected about the mining and uses of stones by Indians in both North and South America before the coming of the men. Particulars are given for 84 different kinds of stones, and 289 ancient stones are listed and their position marked on maps. Some of the more important stones are emerald, turquoise, jade, amber, obsidian, soapstone, catlinite; from most of these tobacco pipes were carved.

L. J. S.

GH (F. H.). *The formation of jarosite on pyrite ornaments*. Amer. Min., 1941, vol. 26, pp. 562-564, 1 fig.

A necklace found on an Indian skeleton at a site dated about A.D. 1350 in Tlaxcala, Mexico, consists of cylindrical beads of pyrite with turquoise pendants. The pyrite is covered with a crust up to 2 mm. thick, the inner part of which consists of jarosite ($\frac{1}{2}$ mm. thick) together with single crystals (0.025 mm.) of jarosite directly on the bright but fissured pyrite. Outside is a crust of minute crystals of gypsum. The turquoise is not altered.

L. J. S.

Symposium on diamonds. Amer. Min., 1942, vol. 27, pp. 162-191.

US (Edward H.). *Introductory statement* (pp. 162-163).

L (Sydney H.). *Diamond production* (pp. 163-166).

LAN (Lazare). *Cutting of gem diamonds* (pp. 166-171).

ZZ (Paul L.). *Diamonds in the wire drawing industry* (pp. 171-175, 3 figs.).

YNE (Alexander). *Diamond dies in the national defense program* (pp. 175-179).

WSON (Chester B.). *Diamond set tools* (pp. 179-184, 1 fig.).

IN (A. A.). *Bonded diamond wheels* (pp. 184-188).

EMAN (Harry). *Evaluation criteria* (pp. 188-191).

The larger part of the present-day production is of bort used for industrial purposes, and much of it comes from Jurassic-Triassic rocks (derived from pre-Cambrian) in the Belgian Congo. Apart from the third paper, which deals with trade conditions of gem cutting, this series of articles deals with industrial diamonds from a practical point of view [M.A. 8-120]. The last paper deals with mineralogical questions relating to hardness, cleavage, twinning, flaws, habit, inclusions, thermal properties, colour, inversion to graphite, aggregation of crystals.

L. J. S.

BALL (Sydney H.). *The diamond industry in 1940*. Jewelers' Circular-Keystone New York, 1941, reprint 16 pp. Reprinted in *Gemmologist*, London, 1941, vol. 11, pp. 15-16, 20-21, 31-32, 38-40.

A continuation of previous annual reports [M.A. 7-519]. An account is given of trading and cutting under war conditions. The world's production in 1940 is estimated at 14,140,255 carats (2.828 metric tons), showing an appreciable increase in weight though not in value on 1938 (11,623,603 cts.) and 1939 (12,485,952 cts.). Only about 15 % of this was gem material, there being an increased use of industrial diamond. The Belgian Congo produced 77 % of the total weight, but this being largely bort only 24 % of the total value. L. J. S.

Industrial Diamond Review. London (N.A.G. Press), December 1941-→. Monthly. Price 5s. per year.

This new periodical is a supplement to the 'Gemmologist' [M.A. 7-129] as part of the 'Goldsmiths Journal' and is also issued in a separate form (8 pages each month). It collects together all the current information on the use of diamonds for industrial purposes. L. J. S.

NAYAR (P. G. N.). *Luminescence, absorption and scattering of light in diamonds*. Part I. *Fluorescence*. Proc. Indian Acad. Sci., Sect. A, 1941, vol. 13, pp. 483-497, 4 pls., 1 text-fig. Part II. *Phosphorescence*. Ibid., pp. 537-542, 2 pls., 1 text-fig. Part III. *Absorption*. Ibid., 1941, vol. 14, pp. 1-13, 3 pls., 2 text-figs.

The spectrum of the brilliant blue-green glow given by a pale blue diamond in ultra-violet light shows a sharp band at 4156 Å. and rather diffuse bands (not before observed) at 4278, 4387, 4514, 4643 Å. covered by a feeble continuous spectrum to 6300 Å. Other diamonds apparently without fluorescence give the same spectrum on long exposure. The intensity varies widely in different specimens, ranging from about 10,000 to 1. The bands are shifted to rather long wave-lengths as the temperature (-180° to 200° C.) rises. The entire spectrum is excited by rays of any wave-length < 4156 Å. Above 200° C. fluorescence disappears. The bluish tinge of 'blue-white' diamonds is due to fluorescence.

The phosphorescence spectrum, photographed with the diamond between two rapidly rotating perforated disks, shows the same bands, but the continuous spectrum 5050-6300 Å. is brighter than in the fluorescence spectrum. Phosphorescence takes a minute for full excitation and several minutes for its decay; at liquid air temperature it decays in a few seconds, and at higher temperature it is brighter. Part III gives absorption spectra in the visible and ultra-violet regions. L. J. S.

CHESLEY (Frank G.). *Investigation of the minor elements in diamond*. Amer. Min., 1942, vol. 27, pp. 20-36, 5 figs.

The emission spectra of thirty-three diamonds from known localities have been recorded for wave-lengths 2800-4600 Å. Traces of Al, Si, and Cu were found present in every diamond examined and similarities were observed in the spectra of diamonds from the same locality. The absorption spectra in the ultra-violet

of six diamonds revealed only one of the rarer type 2 [M.A. 6-6, 494]. This diamond has the lowest observed minor element content. No correlation between fluorescence and emission spectra could be deduced, but the elements Ag and Ti tend to be present in the coloured stones; and diamonds of cubic habit in both Ag and Ti, whereas octahedra do not.

F. A. B.

(James M.) & DE MENT (Jack). *Cause of fluorescence in diamond*. The Mineralogist, Portland, Oregon, 1942, vol. 10, pp. 45-46, 64-67, 1 fig.

DE MENT (H. C.). *Fluorescence in diamonds*. Gemmologist, London, 1942, vol. 11, no. 55.

Diamonds may be divided into three groups according to their behaviour in violet light: blue, yellow, or non-fluorescent. Spectrochemical analysis, which details are given, shows that traces of Al, Ca, Cr, Fe, Mg, Mn, Ni, Rh, Ti are present in addition to carbon. Blue fluorescent diamonds show an absence of chromium, yellow of aluminium, while the non-fluorescent varieties show a preponderance of any foreign element. It is thought that fluorescence may be due to metal atoms of a high atomic order scattered through the crystal lattice.

J. M. S.

DE MENT (Robert M.) & LIDDICOAT (R. T.). *A solution to diamond color grading problems*. Gems & Gemology, Los Angeles, California, 1941, vol. 3, pp. 162-168, 5 figs.

The 'diamolite' is a small open-fronted box painted mat white inside and containing a concealed artificial-daylight lamp with blue filter. Comparison is made with a standard set of stones. The 'colorimeter' is a small closed box with internal lighting and a sliding scale of graded colours 0-6 from colourless to yellow which is viewed through a microscope with the diamond in the same position.

L. J. S.

СЫРОМЯТНИКОВ (F. V.) [СЫРОМЯТНИКОВ (Ф. В.). О создании в СССР промышленности производства синтетического благородного корунда (рубина и сапфира).—SYROMIATNIKOV (F. V.). *On the organization of the synthetic precious corundum (ruby and sapphire) industrial production in the USSR*. Труд. Всесоюз. Научно-Иссл. Инст. Мин. Сырья (Trans. All-Union Sci. Research Inst. Econ. Min.), 1939, no. 146, pp. 5-15, 2 figs. (Russian with English summary.)

A description of recent Russian research on the production of artificial ruby and sapphire, with an account of the applications of synthetic precious corundum in industry.

C. F. D.

DE MENT (Edward) & SHIPLEY (Robert M., Jr.). *The synthetic emerald*. Gems & Gemology, Los Angeles, California, 1941, vol. 3, pp. 146-150, 5 figs.

Emerald, produced artificially in the United States, forms druses of prismatic crystals up to more than $\frac{1}{2}$ inch long, with the crystal-forms *a m c p s*. It has lower values for refractive index (ω 1.562, 1.564, ϵ 1.559, 1.561), birefringence (0.003), and sp. gr. (2.497-2.702) than natural emerald (data given for

material from various localities). It can be distinguished by the absorption spectrum and by the character of the liquid inclusions. [Cf. 'igmerald', M. 6-195, 200, 497; 7-129.] L. J. S.

[POUGH (F.). *Synthetic emerald made in U.S.A.; how to detect it*. Jewelers Circular-Keystone, New York, July 1941.]

ANDERSON (B. W.). *More news of synthetic emerald*. Gemmologist, London 1941, vol. 11, pp. 9-11, 6 figs.

Anderson gives a review of the papers by Pough (reproducing his illustration) and Gübelin and Shipley (preceding abstract), comparing the data with those 'igmerald' made in Germany. The process of manufacture remains a secret.

L. J. S.

BAGROWSKI (Benedict P.). *Pyrope garnet vs. ruby spinel in Kansas*. Am. Min., 1941, vol. 26, pp. 675-676.

A red to reddish-brown mineral occurring as grains (up to 1 cm.), together with ilmenite and phlogopite, in serpentinized peridotite near Stockdale, Riley Co., has hitherto been regarded as ruby-spinel. Analysis of material recently collected proves it to be pyrope with high Cr_2O_3 : SiO_2 40.42, Al_2O_3 21.12, Cr_2O_3 7.90, Fe_2O_3 10.50, MgO 14.42, CaO 4.71 — 99.07; sp. gr. 3.47, H. $7\frac{1}{2}$, n 1.746.

L. J. S.

ROSENCRANS (Harold I.). *Colorado lapis lazuli*. Gems & Gemology, Los Angeles, California, 1941, vol. 3, pp. 154-156.

Veins of deep blue to almost black lapis-lazuli (sp. gr. 2.82-2.85) occur in bla Palaeozoic limestone intruded by diorite-porphry on Italian Mountain in the Sawatch Range.

L. J. S.

PEARL (Richard M.). *Turquoise deposits of Colorado*. Econ. Geol., 1941, vol. 36, pp. 335-344.

Turquoise is obtained at the Hall mine, 8 miles NW. of Villagrove, Saguache Co., in Oligocene felsite porphyry; at the King mine, 10 miles E. of Manassas Conejos Co., in Miocene (?) felsite porphyry; at the Turquoise Chief mine, 7 miles NW. of Leadville, Lake Co., in Algonkian granite; and in a stream bed near Creede, Mineral Co. The lode deposits were formed by meteoric waters that leached the constituents from alkali-felspars, neighbouring copper ores, and apatite, and deposited them in fractures. With an output of \$38,000 worth of gem material in 1938 Colorado is second to Nevada in U.S. turquoise production. [M.A. 8-123.]

M. A. P.

ROBINSON (C. H.). *Turquoise crystal locality*. The Mineralogist, Portland, Oregon, 1942, vol. 10, pp. 43-44, 2 figs.

A recent visit to the dump-heaps at the famous turquoise crystal locality near Lynch, Virginia (W. T. Schaller, 1912), has produced a few more specimens of turquoise including a well-crystallized variety containing Fe_2O_3 5%. The X-ray pattern is close to that of pure turquoise, but the name *ferri-turquoise* has been

gested by E. E. Fairbanks. Vague reference is made to recent investigation of the formula given as $\text{CuAl}_6(\text{OH})_8 \cdot 5\text{H}_2\text{O}$ is obviously intended to be $\text{Cu}_6(\text{PO}_4)_4(\text{OH})_8 \cdot 5\text{H}_2\text{O}$. J. M. S.

LEUX (Lucien). *Diffusion de l'odontolite dans les phosphates suessoniens du Hodna (département de Constantine)*. Compt. Rend. Acad. Sci. Paris, 1941, vol. 212, pp. 413-414.

Small (exceptionally 3 cm.) fragments of bone and teeth coloured blue are present in the phosphate of this deposit. L. J. S.

MAN (Daniel) & JOHNSON (W. W. A.). *Note on a spectrographic study of Central American and Asiatic jade*. Journ. Opt. Soc. Amer., 1941, vol. 31, pp. 85-86.

The carbon-arc spectra of several jade objects from the ancient Maya site of Chichen Itza are compared with those of jade from China, Burma, New Zealand, and De Kalb, New York, and the finds for 22 elements are tabulated. There are marked differences and the results agree with those of H. S. Washington [p. 2-67]. L. J. S.

MYRT (Edna M.). *Scott rose quartz mine*. Rocks and Minerals, Peekskill, N.Y., 1941, vol. 16, pp. 360-363, 4 figs.

A short description of the Scott rose-quartz mine near Custer, Black Hills, South Dakota. The rose-quartz occurs in pegmatite and is of a fine, deep colour which does not fade on exposure. Associated minerals include beryl and black maline. J. M. S.

RICHESTER (James G.). *Collecting semi-precious stones in Florida*. Rocks and Minerals, Peekskill, N.Y., 1941, vol. 16, pp. 435-454, 14 figs.

After a brief reference to previous work on the subject, the writer gives a description of his own experiences in collecting the famous pseudomorphs of chalcodony after coral from the shores of Hillsborough Bay, Tampa, Florida. The best specimens are those excavated from the clay of the 'silex bed' at East Point which is accessible only under certain conditions at low tide, but the good material can also be picked up on the shore. The corals are mushroom-shaped or branching and on breaking are found to be hollow, sometimes enclosing a fluid, and lined with quartz crystals and chalcodony of different colours. Fluorescence and phosphorescence have been observed; the former is thought to be due to traces of crude oil dispersed in the chalcodony subsequent to the death of the polyp and the latter to residual calcite from the skeleton. The article is illustrated by a number of excellent photographs. J. M. S.

WERNER (Thomas A.). *Agates of the Yellowstone river valley, Montana*. Rocks and Minerals, Peekskill, N.Y., 1941, vol. 16, pp. 319-325, 1 fig.

The author, by personal observations, shows that the agates of the Yellowstone river, concentrated between Billings and Sidney, Montana, were not moved, as popularly supposed, from the Rocky Mts., but were brought by local glacial action from the porphyry of the Big Horn Mts. to the flood plain of the

Yellowstone valley and distributed by river ice and flood water. The style of writing makes the reasoning rather difficult to follow and the reader is grateful for the summary which concludes the article. J. M. S.

PEARL (Richard M.). *Florissant, Colorado gem locality*. The Mineralogist, Portland, Oregon, 1941, vol. 9, pp. 283-284, 311-313, 1 fig.

The gem locality Crystal Peak (at one time confused with Crystal Park and Pikes Peak) is situated near Florissant in Teller Co., Colorado. The minerals of which amazonstone, quartz, phenakite, and topaz are the most important occur in cavities of pegmatite. The rock is much decomposed and specimens are often found loose in the surrounding debris. J. M. S.

Miscellaneous.

ORCEL (Jean) & RENAUD (Paul). *Étude du dégagement d'hydrogène associé au départ de l'eau de constitution des chlorites ferromagnésiennes*. Compt. Rend. Acad. Sci. Paris, 1941, vol. 212, pp. 918-921, 1 fig.

Chlorites give off their water of constitution in two stages at about 500° and 700°; at the latter temperature with the development of heat, due, it has been suggested, to the reaction $2\text{FeO} + \text{H}_2\text{O} = \text{Fe}_2\text{O}_3 + \text{H}_2$. To test this, two chlorites containing FeO 18.73 and 1.24 % were heated in vacuo. The former gave much more hydrogen (detected spectroscopically) with an increase in pressure at both 500° and 700°. L. J. S.

SERVIGNE (Marcel). *Sur la photoluminescence des scheelites*. Compt. Rend. Acad. Sci. Paris, 1940, vol. 210, pp. 440-442.

Spectroscopic examination of scheelites from several localities and of different modes of occurrence showed the presence of Pr, Nd, Sm, Eu, Gd, Tb, Dy, Er. High Eu_2O_3 (about 0.2 %) is present in specimens from Swaziland, Salzburg, and Brazil. L. J. S.

[ZEMEL (V. K.)] Земель (В. К.). *Анализы монацитов из золотоносных россыпей Алдана и ю. Енисея*.—SEMEL (W. K.). *Analysen der Monacite und Goldseifen des Aldans und des südlichen Jenissei*. Журнал Прикладной Химии (Journ. Appl. Chem.), Leningrad & Moscow, 1936, vol. 9, pp. 1969-1971. (Russian with German summary.)

Two analyses of monazite, from Aldan and from southern Yenisei, show marked difference in thorium content but the proportions of the other rare-earth elements (La, Ce, Pr, Nd, Sm, Eu, Gd, Ho, Yt) are nearly the same. M. H. H.

HUTTON (C. Osborne). *Inesite from Waihi mine, North Island, New Zealand*. Trans. Roy. Soc. New Zealand, 1941, vol. 71, pp. 99-102, 1 fig.

Optical determinations on this material [M.A. 7-159] gave α 1.6185, β 1.639, γ 1.6498, 2V 73-75°, negative, extinction on (100) cleavage 10-13°, $\alpha : c = 77^\circ$, $\beta : c = 34^\circ$, $\gamma : c = 58^\circ$; H. 5½-6, sp. gr. 3.003. Seelye's analysis deducting quartz, MgCO_3 , &c.; is recalculated as SiO_2 46.27, MnO 36.57, CaO 8.21, H_2O 8.95 = 100.00. This still shows more silica than required (44.42 %) by the

ula of Glass and Schaller [M.A. 7-465], and the excess is probably present
 overgrown quartz.

L. J. S.

CON (C. Osborne) & SEELYE (F. T.). *Composition and properties of some
 New Zealand glauconites*. Amer. Min., 1941, vol. 26, pp. 595-604, 1 fig.

Chemical and physical data are given for seven samples of glauconite separated
 from greensands of the Upper Cretaceous and Tertiary formations.

	1.	2.	3.	4.	5.	6.	7.
...	49.07	52.64	49.29	43.33	48.54	47.42	47.15
...	0.15	0.16	0.12	0.20	0.10	0.10	0.14
...	10.95	5.78	3.17	7.27	7.82	7.19	6.20
...	15.86	17.88	21.72	24.87	17.50	22.64	21.50
...	1.36	3.85	3.19	2.90	3.07	3.39	3.76
...	tr.(?)	trace	trace	trace	trace	tr.(?)	tr.(?)
...	4.49	3.43	3.85	2.95	3.26	2.28	2.80
...	0.07	0.12	0.74	0.10	0.68	0.27	0.46
...	0.13	0.18	0.12	0.02	0.22	0.05	0.13
...	7.51	7.42	6.02	6.00	5.87	7.46	6.98
...	0.19	0.18	0.32	0.15	0.14	0.22	0.19
...	0.07	n.d.	n.d.	n.d.	0.03	0.04	0.05
...	0.06	n.d.	n.d.	n.d.	0.05	0.05	0.06
...	nt.fd.	n.d.	n.d.	n.d.	nt.fd.	nt.fd.	0.04
...	nt.fd.	n.d.	n.d.	n.d.	nt.fd.	nt.fd.	nt.fd.
...	6.63	5.86	7.21	6.22	6.00	6.07	6.47
...	3.66	2.83	4.60	5.94	6.71	3.01	4.20
	100.20	100.33	100.35	99.95	99.99	100.19	100.13
...	2.687	2.708	2.580	2.737	2.555	2.790	2.770
...	1.601	1.602	1.592	1.610	1.600	1.602	1.604
...	1.615	1.618	1.614	1.634	1.621	1.267	1.624
deg.)	10°	10-20°	10°	10°	13°	12°	10-20°

plot shows increase of α , γ , and $\gamma-\alpha$ with increase in Fe_2O_3 . Gruner's
 formula for glauconite [M.A. 6-333] agrees well with these analyses.

F. A. B.

RANKAMA (Kalervo). *On the mineralogy of some members of the humite group found
 in Finland*. Bull. Comm. Géol. Finlande, 1938, no. 123, pp. 81-94, 1 fig.

Five new chemical analyses and seven partial analyses ($\text{FeO} + \text{MnO}$), with
 physical data, are given of norbergite, chondrodite, and humite from Finnish
 metamorphic limestones of Archaean age. These include (I) norbergite from
 Rankala (anal. Olai Järnefeldt), (II) chondrodite from Ersby (anal. Rankama),
 and humite from Hermala (anal. Järnefeldt).

	SiO_2 .	TiO_2 .	Al_2O_3 .	Fe_2O_3 .	FeO .	MnO .	MgO .	CaO .	Na_2O .	K_2O .
...	29.60	n.d.	0.53	0.60	0.96	0.002	58.70	n.d.	n.d.	n.d.
...	34.27	0.36	0.22	0.36	4.36	0.003	55.01	0.04	0.13	0.07
...	34.56	n.d.	1.46	2.66	7.77	0.66	48.93	n.d.	n.d.	n.d.
	Total									
	H_2O .	F_2 .	$-\text{O} = \text{F}_2$.	Sp. gr.	α .	β .	γ .	$(+)\text{2V}$.		
...	1.50	13.55	99.73	3.181	1.563	1.567	1.590	44°		
...	0.94	6.99	99.81	3.221	1.602	1.612	1.633	71°		
...	1.70	3.68	99.87	3.273	1.643	1.655	1.675	68°		

C. F. D.

SAHAMÄ (Th. G.) & VÄHÄTALO (Veikko). *The rare earth content of wiikite*. B. Comm. Géol. Finlande, 1939, no. 125, pp. 98–109, 10 figs.

A study, by X-ray spectrography, of the content of the various rare-earth elements in six specimens of wiikite, one of orthite, and one of monazite, from the Archaean pegmatites of Impilahti, Finland. C. F. D.

GEIJER (Per). *The paragenesis of ludwigite in Swedish iron ores*. Geol. F. Förh. Stockholm, 1939, vol. 61, pp. 19–33, 3 figs.

The occurrence of ludwigite (magnesioludwigite to vonsenite), associated with saibelyite, leuchtenbergite, humite minerals and, rarely, fluorborite, in a number of small magnetic skarns in Sweden is evidence that these skarns have arisen by contact metasomatism. The magnetite in the borate skarns is often martitized and shows a good octahedral parting: a pure specimen from Sjögruvan, Svärdsjö, analysed by A. Bygdén, gives SiO_2 0.06, TiO_2 0.004, Al_2O_3 0.19, Fe_2O_3 68.7, FeO 29.38, MnO 0.18, MgO 0.90, CaO 0.10, H_2O 0.17, CO_2 0.03, insol. in 20% HCl 0.49 = 100.074. C. F. D.

JAKOB (J.). *Chemische und strukturelle Untersuchungen am Staurolith*. Schweiz. Min. Petr. Mitt., 1941, vol. 21, pp. 124–130.

Six detailed analyses are given each of a single crystal of staurolite, free from inclusions, from the Campolungo district, Tessin. Owing to the difficulty of decomposing the mineral, iron is assumed to be present as FeO , and water determined by the author's method [M.A. 8–90]. The extreme values are: SiO_2 27.24–27.83, TiO_2 0.55–0.88, Al_2O_3 51.94–54.76, FeO 10.22–14.72, MnO 0.00–0.12, MgO 2.45–2.90, CaO 0.00, Na_2O 0.20–3.19, K_2O 0.04–0.24, $\text{H}_2\text{O} +$ 0.00–2.6, $\text{H}_2\text{O} -$ 0.00, sp. gr. 3.641–3.723. A general formula is written as $4-4\frac{1}{2}\text{Fe}^{2+} \cdot 8\text{Al}_2\text{O}_3 \cdot 7\text{SiO}_2 \cdot 0-2\frac{1}{2}\text{H}_2\text{O}$, in which Ti, Mn, Mg, Na, and K are included with Fe. An approximation to the X-ray formula [M.A. 4–160] is given as $(\text{Fe} + \text{Na})_{4.8} \cdot \text{Al}_{18} \cdot \text{Si}_8 \cdot \text{O}_{48}$; water (absent in one analysis) is regarded as not essential to the structure. L. J. S.

JAKOB (J.). *Chemische und strukturelle Untersuchungen am Disthen*. Schweiz. Min. Petr. Mitt., 1941, vol. 21, pp. 131–135.

Five new analyses of kyanite from the Campolungo district, Tessin [M.A. 7–257], confirm the presence of alkalis. The extreme values are: SiO_2 36.1–37.03, Al_2O_3 59.56–62.31, Fe_2O_3 0.00–0.59, Na_2O 0.76–1.22, K_2O 0.26–0.9, $\text{H}_2\text{O} +$ 0.27–1.66, $\text{H}_2\text{O} -$ 0.00, sp. gr. 3.529–3.632, corresponding to $40\text{Al}_2\text{SiO}_5 \cdot 1-2\text{Na}_2\text{O} \cdot 1-6\text{H}_2\text{O}$. L. J. S.

MACGREGOR (A. M.). *Gorceixite from Southern Rhodesia*. Bull. Imp. Inst. London, 1941, vol. 39, pp. 399–401.

Smooth bean-like pebbles, reddish-brown to grey in colour, have been found in the diamond-bearing Triassic gravels of the Somabula forest in Southern Rhodesia. An incomplete analysis was given in 1921 [M.A. 2–232], and the following new analysis by E. Golding is now given: P_2O_5 22.39, Al_2O_3 37.96, CeO_2 7.0, Fe_2O_3 3.76, MgO 1.28, BaO 11.88, CaO nil, SiO_2 1.25, H_2O 15.05 = 100.57. The

as with Hussak's formula $\text{BaO} \cdot 2\text{Al}_2\text{O}_3 \cdot \text{P}_2\text{O}_5 \cdot 5\text{H}_2\text{O}$ for gorceixite, with Ce replacing Ba [or as admixed florencite?]. Sp. gr. 3.185, n 1.62; anisotropic dusty inclusions. Mention is made of the recent discovery of gorceixite, associated with diamond, in Gold Coast, Sierra Leone, and British Guiana.

L. J. S.

LEY (Elmer B.). *Genesis of graphitic calcite*. The Mineralogist, Portland, Oregon, 1941, vol. 9, pp. 420-421.

Lakes of graphite occur between grains of calcite in a deposit on the east of the Hudson river, above Warrensburg, New York. The loose, granular calcite has been formed by the metamorphism of limestone whose organic content has given rise to the graphite.

J. M. S.

SON (Edward). *Notes on the occurrence of gudmundite*. Econ. Geol., 1941, vol. 36, pp. 175-184.

Review of the properties of gudmundite and the reported occurrences and localities in Sweden, Norway, Turkey, Germany, and Canada (Yellowknife, N.T.). The hardness of the Canadian material (F , like mispickel) does not differ with hardness 4 (like pyrrhotine) for the Swedish mineral. [Min. Mag. 22-23, M.A. 4-12; 7-166, 387; 8-247.]

M. A. P.

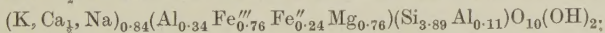
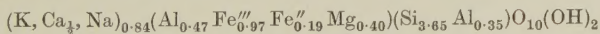
OCKÝ (Vojtěch). *Ein Beitrag zur Morphologie des Pyrites*. Zeits. Krist., 1940, vol. 103, pp. 30-40, 5 figs.

A two-circle goniometer for measuring crystals weighing up to 1 kg. is described and figured. Measurements were made with the instrument on large crystals of pyrite from Gellivara, Sweden; Bakovića, Sarajevo, Yugoslavia; Rio Marina, Sicily; Brosso and Traversella, Piedmont, Italy.

F. A. B.

DRICKS (Sterling B.) & Ross (Clarence S.). *Chemical composition and genesis of glauconite and celadonite*. Amer. Min., 1941, vol. 26, pp. 683-708, 4 figs.

X-ray powder patterns of a specimen of glauconite and three of celadonite analysed by R. C. Wells [M.A. 7-32] show no observable differences. The work and a review of forty-one previous analyses of glauconite and ten of celadonite show that both minerals belong to the heptaphyllite group of micas; they are represented respectively by the formulae:



glauconite and celadonite are termed metacolloids, and both names are justified, since these minerals are 'of quite different occurrence and paragenesis'.

F. A. B.

Y (Arthur). *The sulphide and carbonate constituents of coal seams*. Proc. Geol. Assoc. London, 1941, vol. 52, pp. 183-193, 1 pl., 4 text-figs.

A distinction is made between primary pyrite replacing plant tissue and secondary pyrite associated with ankerite or dolomite, deposited

chiefly in cleat fissures along which solutions could pass. Cryptocrystalline siliceous [quartz?] is also frequently present with the carbonates. F. A. B.

COOKE (H. C.). *A metamorphic origin of selenite*. Amer. Journ. Sci., 1941, vol. 23, pp. 658-660, 1 pl.

Thick beds of gypsum in conglomerate and sandstone of the Windsor series on Cape Breton Island, Nova Scotia, show, where the strata have been folded, thin white streaks and porphyritic crystals of clear gypsum (selenite). L. J. S.

HACQUAERT (Armand). *Een fulguriet uit de Limburgsche kempen.—Une fulgurite de la campine Limbourgeoise*. Natuurwet. Tijds. Gent, 1939, vol. 21, pp. 3-4, 1 pl. (Flemish with French summary.)

A fulgurite found in sand dunes near Lommel, Belgium, is described and figured. The isotropic glass (n 1.46) contains many bubbles enclosing air and water. M. H. H.

STEVENSON (John S.). *An occurrence of stolzite in the Cariboo district, British Columbia*. Univ. Toronto Studies, Geol. Ser., 1941, no. 46, pp. 137-139, 1 fig.

Stolzite with ω (Na) 2.27, ϵ (Na) 2.18, occurs as crusts of minute (0.1-1.0 mm) well-developed crystals lining vugs in scheelite-tungstite aggregates. They are found in a quartz vein, 1-4 inches wide, at the Taylor scheelite prospect, on the SW. side of Snowshoe Plateau, 30 miles SW. of Wells. M. A. P.

HAWLEY (J. E.). *Boulangerite from Montgay township, Abitibi County, Quebec*. Univ. Toronto Studies, Geol. Ser., 1941, no. 46, pp. 25-32, 3 figs.

Boulangerite (sp. gr. 5.6) with inclusions of pligionite (?), jamesonite (?), and tetrahedrite, occurs in $\frac{1}{4}$ -inch veinlets in a mineralized sericite-schist on lot 1, concession VI. The mineral was identified by polished sections and an X-ray powder photograph. An analysis of material with inclusions, by E. C. S. Goulson, gave Pb 54.7, Sb 30.4, S 15.1 = 100.2, and Ag 0-0.6 %. M. A. P.

GRAMLING-MENDE (Ilse). *Über den Lievrit von Campiglia Maritima in Toskana*. Zentralblatt Min., Abt. A, 1942, pp. 107-110, 2 figs.

Crystals of ilvaite from this locality gave the forms m s o r b [Dana's letter λ (212) [M.A. 4-520], and new γ (221); and the axial ratios $a:b:c = 0.669:1:0.44$. Analysis (mean of two) gave SiO_2 27.96, Fe_2O_3 20.76, FeO 26.61, MnO 8.6, CaO 13.97, H_2O 2.15 = 100.09, agreeing with the usual formula $\text{HCa}(\text{Fe}^{2+}, \text{Mn}^{2+})\text{Fe}^{3+}\text{Si}_2\text{O}_9$. Sp. gr. 4.12. X-ray measurements gave a 8.82, b 13.12, c 5.87 Å. The values differ slightly from those previously given for ilvaite [M.A. 5-324, 6-41] no doubt owing to the high percentage of manganese. L. J. S.

ARÉVALO (Celso). *Sobre unos cristales de cinabrio de Almadén*. Anal. Cienc. Nat. Madrid, 1941, pp. 47-52, 2 figs.

The crystal figured is of rhombohedral habit and twinned on (10 $\bar{1}$ 0). In addition to the forms c and m , 22 rhombohedra are listed. L. J. S.